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Dell 10GbE Pass Through Module (XAUI) User Manual

P/N: M1601P

Rev 1.0

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Related Documentation

The documentation set accompanying the Pass Through Module includes the following:

Table 1 - Reference Documents and Web Sites

Firmware and Firmware Update Tools	
Dell Pass Through Module Software User Manual	
Latest Supported Cables and Optical Modules	

About this Manual

This User Manual is for the Dell 10Gb Ethernet Pass Through II passs through module.

This manual describes the installation and basic use of Dell 10GbE 16 port Pass Through Module for blade servers.

Intended Audience

This manual is intended for users and system administrators responsible for installing and setting up the Dell 10GbE 16 port Pass Through Module for blade servers.

Conventions

The terms downlink (internal–from servers) and uplink (external–out to the world) are used throughout the document. Downlink refers to server connections through the backplane where Ethernet is used. Uplink refers to the outside network, where a different Ethernet protocol is used.

Caution: This symbol indicates the possibility of physical injury to the user or installer.

The term PTM is used to indicate the Dell 10GbE 16 port Pass Through Module.

1 Overview

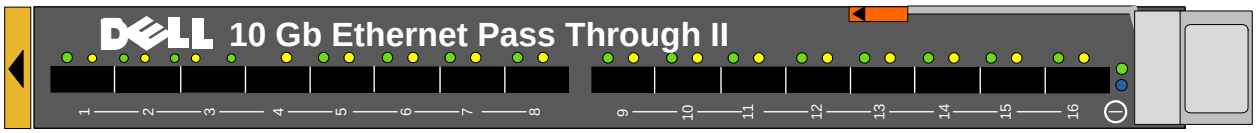
The PTM is an I/O module designed for the PowerEdge M1000e Dell Chassis. The product provides 10Gigabit connectivity for blade servers to Ethernet LANs. The product supports the following Ethernet protocols.

Table 2 - Protocols

Physical Connections	Pass Through II Protocol
Blade Servers to PTM (Internal Links)	XAUI
Front Panel Ports (External Links)	10G XFI

Each front panel port provides connectivity to the blade with the corresponding number in the chassis.

Figure 1: Pass Through II Front Panel



1.1 Features

The PTM feature set includes:

Internal Links

- 16 links of 10Gb Ethernet through the backplane

External links

- 16 SFP+ front panel ports of 10Gb Ethernet

IEEE and Other Ethernet Standards Compliance

- IEEE 802.3ae 10Gigabit Ethernet support
- IEEE 802.3ap Ethernet Operation over Electrical Backplanes
- Jumbo Frames up to 9K support

Connectors and Cabling

- Twin Axial Pair connector
- Optical modules for SR and LR
- All ports support active cables

Front Panel Indicators

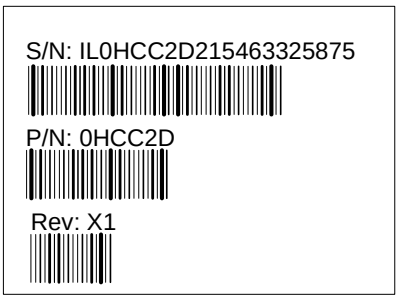
- Per port status LEDs: Link Up, Link Activity

- System status LEDs: Power Supply, Status

1.2 Serial Number and Product Version Information

The serial number and product version information are found on the label seen in the figure below.

Figure 2: Generic Product label



2 Installation and Basic Operation

2.1 Unpacking the Pass Through Module

Before you install your new PTM, unpack it and make sure that there is no visible damage that may have occurred during shipping. Your package should contain the following items:

- Dell -10GbE Pass Through Module for Blade Servers
- This User's Manual

The PTM is shipped without optical modules.

If anything in the package is damaged or missing, please contact your customer representative immediately.

2.2 Insertion and Removal of the PTM

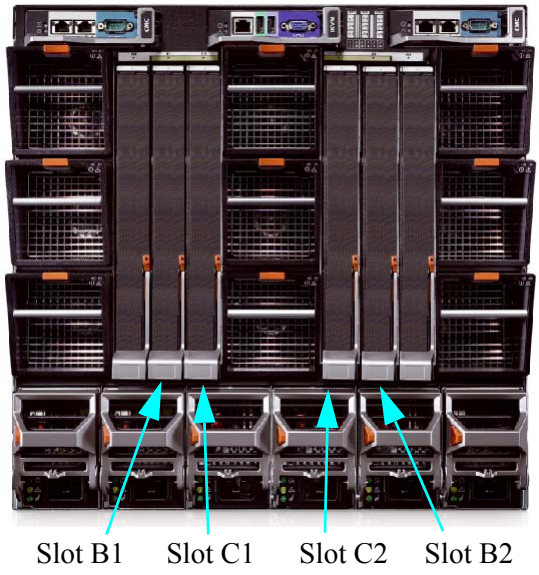
The Dell 10Gb Ethernet Pass Through II may be plugged into fabric slots B1, B2, C1, and C2.

Determine which slot to use, based on desired system configuration.

2.2.1 PTM Insertion

Insert the PTM into the chassis as shown in the following diagram:

Figure 3: Dell Chassis Slots for the PTM



The PTM supports hot-insertion into the chassis. If the PTM is inserted to a powered chassis, the power LED (green) should turn on immediately.

2.2.2 PTM Removal

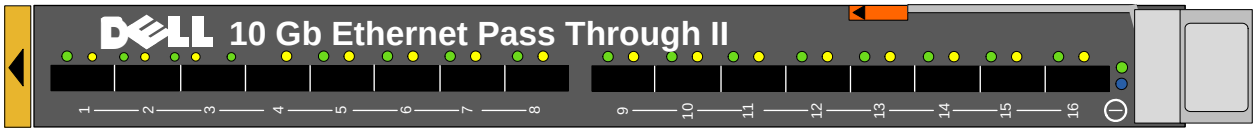
The PTM supports hot-removal. It may be removed when the chassis is powered on or off.

The PTM must not be removed during a firmware update process.
Note: Firmware update is in progress when the amber LED is blinking.

2.3 Connecting the External Ports

The PTM front panel presents 16 SFP+ ports. Each port provides connectivity to a server with the respective number. Figure 4 shows the front panel view of the PTM.

Figure 4: Pass Through II Front Panel



2.3.1 10 Gigabit Ethernet SFP+ Modules

The PTM supports SFP+ modules for 10 Gigabit Ethernet, with 10GBASE-SR and 10GBASE-LR PHYs. SFP+ modules must be approved for use with this PTM. Modules not approved may not work. See Supported Optical Modules and DCAs on page 17 for lists of approved DCAs and optical modules.

2.3.2 Installation and Removal of Optical Transceiver Modules

Optical transceiver modules have a locking mechanism which can be opened or closed.

To insert the module into the cage:

1. Open the module's locking mechanism.
2. Make sure that the male connectors on the module aligns with the female connector inside of the cage. Also check that there is no dirt or foreign matter in the module or in the cage.
3. Insert the module into the adapter card module cage.
4. Close the locking Mechanism.

To remove the module from the cage:

1. Unlock the locking mechanism by opening the handle.
2. Pull the module out of the cage.

2.4 LED Indicators

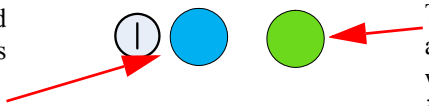
2.4.1 System LEDs

The system status LEDs indicate whether the PTM is receiving power from the chassis, and the state of the PTM.

There are two system LEDs on the end of the module. The LED indications and meanings are explained in the figure and table below.

Figure 5: Indicator LEDs

The IO Module is on and ready when this LED is green.



This LED can be blue or amber. A fault is indicated when the amber LED is blinking. See Table 3.

Table 3 - PTM states and LED configurations:

LED			Module Status
Indication	**Status**	**Power**	
	OFF	OFF	OFF
	OFF	ON	Boot in Progress PTM not ready
Blinking Blue	BLINKING BLUE	ON	The CMC is identifying the newly installed PTM
	ON BLUE	ON	PTM is on and operating Normally
	ON or BLINKING AMBER	ON	FW update is in progress or Fault in System Self-diagnosed
	ON or BLINKING AMBER	OFF	Fault in System CMC-detected

2.4.2 Port LEDs

The PTM has two I/O LEDs per port. The I/O LEDs are located on the I/O panel. The green LED, when lit, indicates that the driver is running and a valid physical connection between nodes exists. If the green LED is blinking, it indicates a problem with the physical link. The yellow LED when lit, indicates a valid data activity link, this is the logical link. The yellow LED illuminates when the network is discovered over the physical link. A valid data activity link without data transfer is des-

ignated by a constant yellow LED indication. A valid data activity link with data transfer is designated by a blinking yellow LED indication. If the LEDs are not active, either the physical link or the logical link (or both) connections have not been established.

Figure 6: Physical and Logical Link Indications

LED			Port Status
Indication	**Green**	**Amber**	
	OFF	OFF	OFF
	ON	OFF	Physical link up No logical link
	BLINKING	OFF	Problem with the physical link No logical link
	ON	ON	Physical link up Logical link up, no data transfer
	ON	BLINKING	Physical link up Logical link up, with data transfer

2.4.3 Installation Safety Warnings

1. Installation Instructions

Read all installation instructions before connecting the equipment to the power source.

2. Over-temperature

This equipment should not be operated in an area with an ambient temperature exceeding the maximum recommended: 40°C (104°F). An air flow of 9CFM at this maximum ambient temperature is required.

3. During Lightning - Electrical Hazard

During periods of lightning activity, do not work on the equipment or connect or disconnect cables.

4. Copper Direct Attached SFP+ Cable Connecting/Disconnecting

Copper Direct Attached SFP+ cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings and instructions.

5. Equipment Installation

This equipment should be installed, replaced, or serviced only by trained and qualified personnel.

6. Equipment Disposal

Disposal of this equipment should be in accordance to all national laws and regulations.

7. Local and National Electrical Codes

This equipment should be installed in compliance with local and national electrical codes.

8. Hazardous Radiation Exposure

Caution – Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT and reference to the most recent laser standards:
IEC 60825-1:2007/03 y EN 60825-1:2007

2.4.4 Mechanical Installation

2.4.4.1 To install the PTM

1. Make sure that there is no foreign matter or dirt in the back plane connector or in the chassis slot.
2. Push the PTM into the chassis. Make sure that the ears on the latch hook onto the latching bar.
3. Push the latch handle towards the orange latch release until it locks.

2.4.4.2 To remove the PTM

1. Push the orange latch release and the latch handle will pop out
2. Pull the handle out until it is 90 degrees from the front of the PTM.
3. Pull the PTM out of the chassis.

2.4.5 Cable Installation

All cables can be inserted or removed with the unit powered on. To insert a cable, press the connector into the port receptacle until the connector is firmly seated. The GREEN LED indicator, above each SFP+ port, will light when the physical connection is established (that is, when the unit is powered on and a cable is plugged into the port with the other end of the connector plugged into a functioning port). After plugging in a cable, lock the connector using the latching mechanism particular to the cable vendor. When a logical connection is made the yellow light will come on. When data is being transferred the yellow light will blink.

Always install and remove cables by pushing or pulling the cable and connector in a straight line with the pass through module.

To remove, disengage the locks and slowly pull the connector away from the port receptacle. Both LED indicators will turn off when the cable is unseated.

Cable lengths should be used which allow for routing horizontally around to the side of the chassis before bending upward or downward in the rack.

Cables, especially long copper cables, can weigh a substantial amount. Make sure that the weight of the cable is supported on its own and not hanging from the pass through module.

3 Troubleshooting

As soon as a pass through module is plugged in make sure that the status LED shows green.

The power LED for the pass through module shuts off:

1. Check that the there is adequate ventilation.
2. Make sure that there is nothing blocking the front or rear of the chassis and that the fan modules and ventilation holes are not blocked (especially dust over the holes).
3. If you find dust blocking the holes it is recommended to clean the fan unit and remove the dust from the front and rear panels of the pass through module using a vacuum cleaner.
4. Remove and Reinstall the PTM.

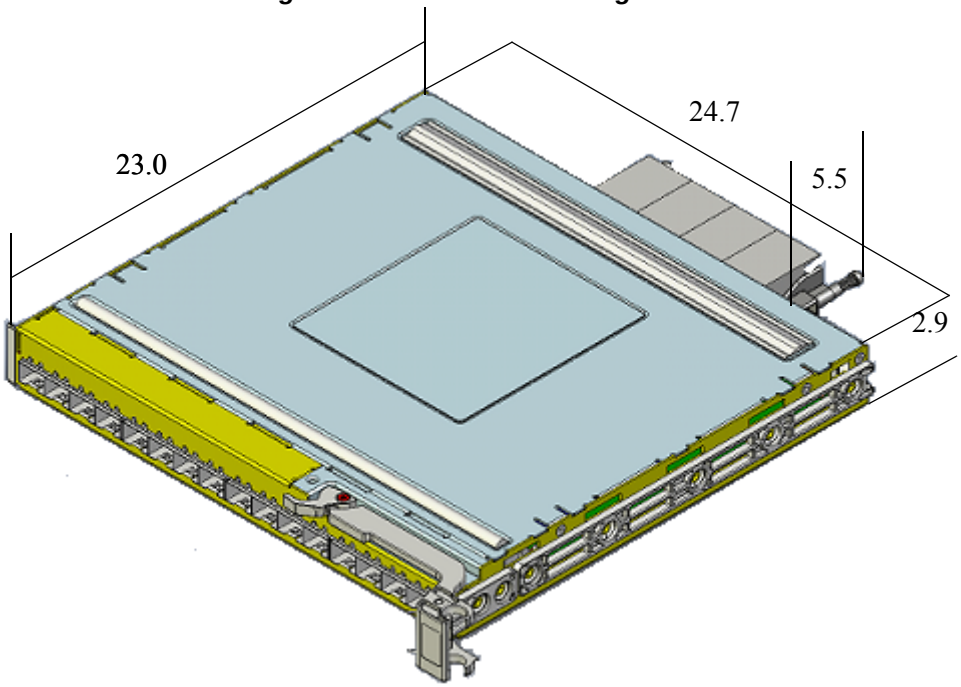
Appendix A: Specifications

Table 4 - Dell 10Gb Ethernet Pass Through Module Specification Data

Physical		**Power and Environmental**	
Size: W X D X H Weight:	 24.7 cm X 28.5 cm X 2.9 cm 1.978kg	Maximum Power:	40.55W passive cables 53.73W active cables
SerDes Speeds:	10, Gb/s per port	Typ Power:	34.41W passive cables 50.59W active cables
Connectors and Cabling:	SFP+	Temperature:	0° to 40° Celsius
		Humidity:	10% - 90% non-condensing
Optical Cable:	Direct attached copper cables supported Optical cables supported	Altitude: Shock: Vibration:	
Port Types:	SFP+	Power through SFP+:	
Air Flow:	3CFM @ 30°C ambient temperature 9CFM @ 40°C ambient temperature		max 1W per port
Protocol Support		**Regulatory Compliance**	
Ethernet: Blade Servers to PTM (Internal Links):	IEEE 802.3ae 10Gigabit Ethernet support IEEE 802.3ap Ethernet Operation over Electrical Backplanes	Safety:	UL60950 C-UL to CAN/CSA 22 2 No.60950-1 TUV/GS to EN 60950-1, Amendment A1-A4, A11 CB-IEC60950-1, all country deviations
Front Panel Ports (External Links):	XAUI 10G XFI	EMC (Emissions):	CC 47CFR Part 15 Class A EN 55022 Class A ICES-003 Class A VCCI Class A AS/NZS CISPR 22 Class A CISPR 22 Class A EN 55024 EN 300386 CE
QoS:	8 Priority Queues for Ethernet	Environmental:	EU: IEC 60068-2-64: Random Vibration EU: IEC 60068-2-29: Shocks, Type I / II EU: IEC 60068-2-32: Fall Test

Appendix A.1: Mechanical Drawing with Dimensions

Figure 7: Mechanical Drawing



Appendix B: Supported Optical Modules and DCAs

The following cables and optical modules are approved for the Dell PTM

Table 5 - DCA (Direct attached SFP+ cables)

DPN	Reference	Length (m)	Speed	Molex Custom PN
K585N	SFP-H10GB-CU1M	1	10.3125Gbps	74752-9093
J564N	SFP-H10GB-CU3M	3	10.3125Gbps	74752-9094
H603N	SFP-H10GB-CU5M	5	10.3125Gbps	74752-9096
G840N	SFP-H10GB-CU7M	7	10.3125Gbps	74752-9098
R620M	30 AWG	0.5	10.3125Gbps	74752-1051
G692K	30 AWG	1	10.3125Gbps	74752-1101
P540M	30 AWG	2	10.3125Gbps	74752-1201
Y984J	28 AWG	3	10.3125Gbps	74752-2301
N651M	28 AWG	4	10.3125Gbps	74752-2401
C855K	28 AWG	5	10.3125Gbps	74752-3501

Table 6 - Optical Modules

DPN	Reference	Speed	Manufacturer
N743D	ASSY,XCVR,SFP+,LC-LC,SFP+SR	10.3125Gbps	Finisar
T307D	ASSY,XCVR,SFP+,LC-LC,SFP+LR	10.3125Gbps	Finisar
W365M	ASSY,XCVR,SFP+,LC-LC,SFP+SR,AV	10.3125Gbps	Avavgo
W373M	ASSY,XCVR,SFP+,LC-LC,SFP+LR,AV	10.3125Gbps	Avavgo

Appendix C: EMC Certification Statements

Table 7 lists the approved certification status per bridge in different regions of the world.

Table 7 - Bridge Certification Status

Pass through Module P/N	FCC Class (USA)	EN Class (Europe)	ICES Class (Canada)	VCCI (Japan)	cTUVus	KCC	CB	c-Tick
M1601P series	A	A	A	A	✓	✓	✓	✓

Appendix C.1: FCC Statements (USA)

Class A Statements:

§ 15.21

Statement

Warning! Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

§15.105(a)

Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix C.1.1: EN Statements (Europe)

EN55022 Class A Statement:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate

Appendix C.2: ICES Statements (Canada)

Class A Statement:

"This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada."

Appendix C.3: VCCI Statements (Japan)

Class A Statement:

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Appendix C.3.1: Translation

"This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions."

Appendix C.4: KCC Certification (Korea)

Korea's "Regulation for Certification of Information and Communication Equipment," requires EMC testing and certification for many electronic products. Korean EMC certifications are issued by Radio Research Laboratory (RRL), which is organized under the Ministry of Information and Communications (MIC). EMC testing includes electromagnetic emissions (EMI) and susceptibility (EMS). Certified equipment is labeled with the MIC mark and certification number.

기 종 별	사 용 자 안 내 문
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Appendix C.4.1: Translation:

"Class A Device This device is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this type was sold or purchased by mistake, it should be replaced with a residential-use type. "

Appendix D: Interface Connector Pinouts

Appendix D.1: SFP+ Interface

Figure 8: SFP+ Connector Pinout - Rear View of Module With Pin Placement

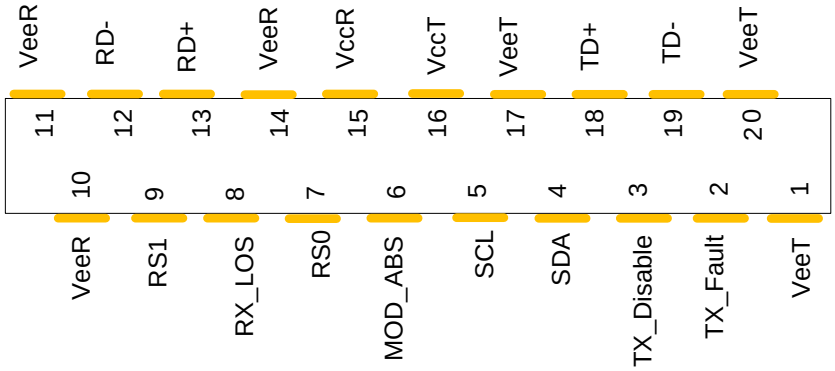

Table 8 - SFP+ Pinout

Pin	Symbol Name	Description
1	VeeT	Transmitter Ground (Common with Receiver Ground) [a]
2	TX_Fault	Transmitter Fault.[b]
3	TX_Disable	Transmitter Disable. Laser output disabled on high or open. [c]
4	SDA	2-wire Serial Interface Data Line [d]
5	SCL	2-wire Serial Interface Clock Line [d]
6	MOD_ABS	Module Absent. Grounded within the module [d]
7	RS0	No connection required
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation. [e]
9	RS1	No connection required
10	VeeR	Receiver Ground (Common with Transmitter Ground) [a]
11	VeeR	Receiver Ground (Common with Transmitter Ground)[a]
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver Non-inverted DATA out. AC Coupled
14	VeeR	Receiver Ground (Common with Transmitter Ground) [a]

Table 8 - SFP+ Pinout

Pin	Symbol Name	Description
15	VccR	Receiver Power Supply
16	VccT	Transmitter Power Supply
17	VeeT	Transmitter Ground (Common with Receiver Ground) [a]
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.
19	TD-	Transmitter Inverted DATA in. AC Coupled.
20	VeeT	Transmitter Ground (Common with Receiver Ground)[a]

a. Circuit ground is internally isolated from chassis ground.
b. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
c. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V
d. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
e. LOS is open collector output. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.